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Hemerotrecha banksi (Arachnida, Solifugae), a diurnal group of solifuges from North America

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Abstract. The *Hemerotrecha banksi* group is revised and the status of the genus *Hemerotrecha* is examined. The female of *H. truncata* Muma 1951 is described for the first time, and five new species are named: *H. hanfordana, H. kaboomi, H. prenticei. H. pseudotruncata*, and *H. vetteri.*

Keywords: Solifuges, new species, distribution, systematics

Although solifuges are considered mainly nocturnal (Muma 1951, 1970; Cloudsley-Thompson 1958; Lawrence 1960, 1962; Punzo 1998), many species are primarily diurnal including species in the South African Solpugidae (Wharton 1981, 1987) and South American members of the Mummuciidae (Maury 1985; Xavier & Rocha 2001). The North American *banksi* group of the Eremobatidae genus *Hemerotrecha* also appears to be diurnal.

The Greek *Hemerous*, the sun, and *trechos*, to run, were used by Banks (1903) to erect the genus *Hemerotrecha*. He designated *Hemerotrecha californica* Banks 1903 as the type species. The collector, Dr. Harold Heath, said, "they run about in the blazing hot sunshine" (Banks 1903). The genus *Hemerotrecha* currently includes 31 species from western United States and northern Mexico (Harvey 2003). As defined by Muma (1951, 1970), the genus *Hemerotrecha* includes small to moderate-sized solifuges bearing a style-like fixed cheliceral finger with the ventral edge irregularly undulate or bearing one or more modified teeth. The mesoventral groove is absent or, at most, very faint. The flagellum complex consists of a dorsal row of striate bristles, the striae formed by very tiny setae, and a ventral row of plumose setae that are more plumose apically (Fig. 1).

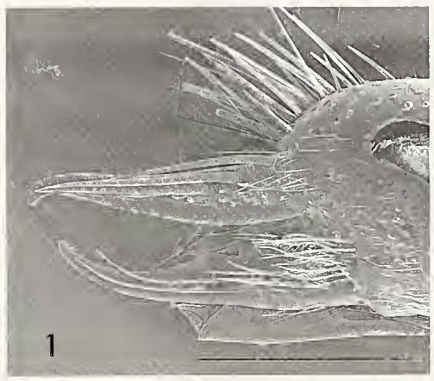
Muma (1951) established the *Hemerotrecha banksi* group for four species all with characters so similar that he thought that they might in fact be one species. The group includes: *H. banksi* Muma 1951, the new name for *H. californica* Banks 1903 (which is a junior secondary homonym of *Cleobis californica* Banks 1899); *H. californica* (Banks 1899); *H. marginata* (Kraepelin 1911); and *H. truncata* Muma 1951. All four species have eyes separated by 1.5–2 diameters, males with the ventral margin of the fixed cheliceral finger irregularly undulate, striate bristles of the flagellum complex indistinctly striate with apical and subapical bristles broad and flattened, and females with roughly triangular genital opercula, with parallel medial margins. Muma's 1970 publication emphasized the shape of the tip of the male fixed finger, length and type of ctenidia, and palpal coloration. In addition we found them to possess dark edges on the anterior of the malleoli in both males and females (Fig. 2), and a cup-like mesoventral groove at the tip of the male fixed finger (arrow, Fig. 3).

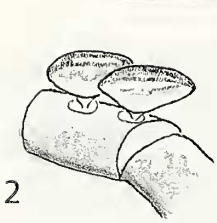
Females were described for *H. banksi* and *H. californica* but not for *H. truncata*. Muma did not examine Kraepelin's types of *Eremobates marginatus* Kraepelin 1911 but used Roewer's (1934) drawings. The type localities of each species were in the state of California and the meager material examined was all from that state except for a male and female from the state of Washington. Muma (1962, 1963, 1970) included specimens from these states as well as Idaho, Oregon, and several specimens that he identified as *Hemerotrecha californica* from the Nevada Test Site. After examining more extensive solifuge collections, particularly those of D. Giuliani (CAS, ESS) including specimens from wide ranging regions of Southern California and Arizona, a collection by Wendel Icenogle of Winchester, California, a collection from Tom Prentice (UCR) and a group sent to us by Richard Zack collected at the Hanford Nuclear Reactor Site, Hanford, Washington, we decided that a revision of the group was in order.

METHODS

Using the methods of Muma (1951), Brookhart & Muma (1981, 1987), Muma & Brookhart (1988), and Brookhart & Cushing (2004), we measured total body length, length of palpus, leg I, and leg IV of both males and females. Length and width of chelicera and propeltidium, width of base of fixed finger, and genital operculum were all measured using Spot Basic™ on an Olympus SZX12. All measurements are in millimeters. Ratios used previously by Muma (1951, 1970, 1989), Brookhart & Muma (1981, 1987), Muma & Brookhart (1988), and Brookhart & Cushing (2002, 2004) were computed. These ratios are as follows: A/CP: the sum of the lengths of palpus, leg I, and leg IV divided by the sum of length of chelicera and propeltidium indicating length of appendages in relation to body size. Long-legged species have larger A/CP ratios. Because there is no fondal notch, the chelicera width/fixed finger width ratio is used to indicate whether the fixed cheliceral finger is thin or robust in relation to the size of the chelicera. Genital operculum length/genital operculum width demonstrates the relative size of the female genital operculum in terms of length and width. No statistical analysis was attempted because of small sample sizes.

Species determinations were based on a combination of color comparisons, general shape of male fixed finger, particularly the tip; palpal setation; ctenidial size and shape. The difference (or similarity) in color pattern between the chelicerae and the propeltidium was noted as was the color pattern of the palpus and legs. The shape of the female chelicera and the female genital operculum margin were observed using the method of Brookhart & Cushing (2004). Due to strong similarities among members of this group, the description of *H. banksi* was used as the basis for all other species descriptions. Female morphology is consistent among the various species; differences are described when necessary.





Figures 1–3.—*Hemerotrecha vetteri* and *H. banksi*. 1. Ectal view of *H. hanfordana* chelicera showing flagellum complex. 2. Ventral view of malleoli of *Hemerotrecha vetteri*, new species showing dark edges. 3. Ectal view of the right chelicera of *Hemerotrecha banksi* holotype showing mesal ventral groove (arrow). Scale bars = 1 mm.

Specimens examined for this study are deposited in the American Museum of Natural History, New York (AMNH); Brigham Young University, Provo, Utah (BYU); California Academy of Sciences, San Francisco (CAS); Denver Museum of Nature & Science, Denver, Colorado (DMNS); Essig Museum, University of California at Berkeley, Berkeley (ESS); University of California at Riverside (UCR); California State University, Northridge (CSN); Florida State Collections of Arthropods, Gainesville (FSCA); Museum of Comparative Zoology, Cambridge, Massachusetts (MCZ); San Diego Museum of Natural History, San Diego, California (SMNH); Washington State University, Pullman (WSU); and Zoologische Staatssammlung, Munich, Germany (ZSM).

SYSTEMATICS

Family Eremobatidae Kraepelin 1901
Subfamily Therobatinae Muma 1951
Genus *Hemerotrecha* Banks 1903

Type species.—*Hemerotrecha californica* Banks 1903 (junior secondary homonym of *Cleobis californica* Banks 1899, now *Hemerotrecha banksi* Muma 1951), by monotypy.

Remarks.—Muma (1951) placed the genus *Hemerotrecha* in the Therobatinae based on the style-like fixed cheliceral finger, undulate ventrally or with small modified denticles, none, or, at best, a very faint mesal ventral groove, and the female operculum variously developed. He later modified his description of the genus *Hemerotrecha* (Muma 1970) by describing the fixed cheliceral finger as weakly curved, undulate, or turned downward at the tip, and the dorsal flagellar setae as striate, spatulate, or hooked. Muma (1989) refined his description of the fixed finger as essentially straight but at times being denticulate, undulate, or serrate and completely lacking a mesal or mesoventral groove, the flagellar setae additionally to include "strong, enlarged, flattened, or hooked" setae, and the female opercula being variable but consistent within species groups.

KEY TO THE MALES OF THE *HEMEROTRECHA BANKSI* GROUP

1 Chelicerae and propeltidium of the same coloration . . 2
Chelicerae paler than propeltidium 5
2 Chelicera and propeltidium pale yellow; eye tubercle pale; cheliceral tip of fixed finger rounded (Fig. 28); palpus dusky on metatarsus and distal 20% of tarsus (Fig. 27); ctenidia short, thin, pointed . . . . *Hemerotrecha marginata*
Chelicera and propeltidium dark to dusky; eye tubercle dark; cheliceral tip hooked (Fig. 45); palpal tarsus either pale or completely dark; ctenidia thin or broad extending from one half to the entire length of the succeeding sternite (Fig. 19) 3
3 Entire body dark; entire palpus (Fig. 46) and appendages dark; chelicera slightly hooked with a distinct ridge on the distal dorsal edge of the fixed finger (arrow, Fig. 44) . . . . . *Hemerotrecha vetteri*
Chelicera and propeltidium blotchy gray or blotchy orange (Fig. 15); palpal metatarsus dark (Fig. 18) 4
4 Cheliceral fixed finger slightly hooked with tiny ridge on the distal dorsal edge of fixed finger, a short, deep concavity on the apical ventral edge of fixed finger (Fig. 16), ctenidia thin and of medium length . . . . . *Hemerotrecha hanfordana*
Cheliceral fixed finger slightly hooked without a distal dorsal ridge or an apical, ventral concavity (Fig. 51), ctenidia short and broad (Fig. 52) . . *Hemerotrecha prenticei*
5 Fixed cheliceral finger gently curved dorsally with rounded, attenuated tip (Fig. 12) 6
Fixed cheliceral finger gently curved dorsally with slightly to strongly hooked tip (Fig. 38) 7
6 Palpus dusky on metatarsus (Fig. 11); 2 long ctenidia extending length of sternal segment (Fig. 13); body pale; without spine-like setae on ventral tarsus and metatarsus of palp . . . . . *Hemerotrecha californica*
Palpus dusky on tarsus and metatarsus (Fig. 7); 2 shorter ctenidia (Fig. 6); body dark; with spine like setae on ventral tarsus and metatarsus of palp (Fig. 7) . . *Hemerotrecha banksi*
7 Fixed cheliceral finger with apical hook but with otherwise typical curved shape (Fig. 22); dusky orange chelicera; blotchy, dark propeltidium (Fig. 21); creamy yellow abdomen . . . . . *Hemerotrecha kaboomi*
Fixed cheliceral finger attenuated with a noticeable hook (Figs. 32, 38); dark to dusky orange chelicera and propeltidium, dusky to dark abdomen 8
8 Fixed cheliceral finger with sharply hooked (parrot beak) tip (Fig. 32); dusky chelicera, blotchy dark propeltidium (Fig. 31) and abdomen; dusky palpal tarsus, metatarsus, tibia and tip of femur . . . . . *Hemerotrecha truncata*
Fixed cheliceral finger with hooked tip but not nearly as deep or sharp as above (Fig. 38); dusky chelicera; blotchy propeltidium (Fig. 37); creamy yellow abdomen; dusky palpal metatarsus (Fig. 39) . . *Hemerotrecha pseudotruncata*

Hemerotrecha banksi Muma 1951
Figs. 3–9, 54

Hemerotrecha californica Banks 1903:79 (junior secondary homonym of *Cleobis californica* Banks 1899).

Hemerotrecha banksi Muma 1951:99–100, figs. 185–192 (replacement name for *Hemerotrecha californica* Banks 1903).

Material examined.—*Types:* USA: *California:* male holotype, Monterey County, Pacific Grove (36.62°N, 121.92°W), no date, H. Heath (MCZ). "Allotype" (designated by Muma 1951), 1 female, San Mateo County, Redwood City (37.49°N, 122.24°W), 18 May 1924, W. Meehan (AMNH).

Other material examined: USA: *California:* Calaveras County: 1 ♂, West Point (38.4°N, 120.53°W), 7 August 1970, S.C. Williams (CAS); Contra Costa County: 2 ♂, 1 ♀, Redwood (37.49°N, 122.29°W), 14 April 1995, J.G. Rozen, J.W. McSwain (ESS); 1 ♂, Walnut Creek (37.90°N, 122.06°W), 3 June 1961, J. Powell (CAS); Marin County: 1 ♂, Tiburon, Ring Mountain (37.92°N, 122.49°W), 13 July 1977, T.S. Briggs (ESS); Monterey County: 1 ♂, Pacific Grove (36.62°N, 121.92°W), no date, E.C. Starks (AMNH); 1 ♀, Redwood City (37.49°N, 122.24°W), 18 May 1962, W. Meehan (AMNH); San Benito County: 1 ♂, 9.7 km SE. of Idria (36.42°N, 120.63°W), 29 June 1954, S.G. Rozen (CAS); 1 ♂, Pinnacle National Monument (36.47°N, 121.17°W), 7 May 1977 C.E. Griswold (CAS); San Mateo County: 1 ♂, 19 April 1918, B.H. Van Duzen (CAS); Sonoma County: 1 ♂, Petaluma (38.26°N, 122.53°W), 4 July 1979, D.H. Kavanaugh (CAS); Santa Clara County: 1 ♀, Jasper Ridge (37.41°N, 122.27°W), 31 October 1952, F.S. Bartholomew (CAS); Santa Cruz County: 1 ♂, Scotts Valley (37.05°N, 122.01°W), 22 May 1990, running on trail, R. Morgan (CAS); 1 ♂, Santa Cruz Grasslands (coordinates not determined), 22 May 1990, R. Morgan (CAS); Santa Margarita County: 1 ♂, 9.7 km E. of San Luis Obispo (35.28°N, 120.66°W), 11 June 1958, J. W. McSwain (ESS).

Diagnosis.—Tip of male fixed cheliceral finger rounded, tapering anteriorally, palpal tarsus dark for at least the distal half, metatarsus dark 80% apically, dusky creamy orange chelicera, dark to dusky light orange propeltidium; ctenidia short (about half the sueceeding segment), pointed. Females with same coloration.

Description.—*Male*, Color: chelicera dusky yellow-orange, propeltidium dusky to dark orange but always darker than chelicera (Fig. 4), eye tuberele dark, abdomen blotchy, dusky to dark, palpal tarsus and apical 80% metatarsus dusky to dark; leg I dark on tarsi and metatarsi, legs II, III, IV dark ventrally.

Chelicera: fixed finger with a small basal rise and a rounded tip, ventral edge straight (although two specimens had a slight ventral concavity) with no apparent hooklike terminus; the mesal ventral groove a small, shallow apical cup; movable finger with large primary tooth, smaller anterior tooth, 1–2 intermediate teeth, the posterior being separated from primary tooth. Small crenulations anterior to anterior tooth. No mesal tooth (Fig. 5). Fondal notch obscure to absent, fondal teeth graded I, III, II, IV. Apical, subapical plumose flagellar bristles as well as dorsal apical cheliceral setae flattened (Fig. 5, arrow).

Propeltidium: eyes separated by 1.5 diameter of eye (Fig. 4).

Abdomen: 2 short, pointed ctenidia ventrally on fourth abdominal sternite (Fig. 6). Edges of malleoli darkly tinged.

Palp: scopula absent; a row of 2–3 spine-like setae on mesal ventral portion of metatarsus (Fig. 7).

Dimensions: male holotype: total length 11.0, cheliceral length 2.6, cheliceral width 1.2, propeltidium length 1.5, propeltidium width 2.0, palpus length 7.2, first leg length 5.0, fourth leg length 12.1. *Ratios*: A/CP 5.92, cheliceral width/fixed finger width 4.28.

Male (5): total length 8.5–11.0, cheliceral length 2.13–2.96, cheliceral width 0.93–1.28, propeltidium length 1.09–1.45, propeltidium width 1.71–2.23, palpus length 6.5–7.8, first leg length 4.6–7.6, fourth leg length 9.0–13.5. *Ratios*: A/CP 5.07–6.99, cheliceral width/fixed finger width 3.55–4.23.

Female: Color: same as males.

Chelicera: fixed finger with large primary tooth and medial tooth, smaller anterior tooth. Two intermediate teeth between primary tooth and medial tooth and medial tooth and anterior tooth. movable finger with medium sized primary tooth and anterior tooth. Two intermediate teeth between primary tooth and anterior tooth, the posterior intermediate tooth in the notch of the primary tooth. No mesal tooth (Fig. 8).

Genital region: genital operculum roughly triangular with parallel median margins, no wings, and a gently curved posterior margin. Genital opening behind the opercular plates (Fig. 9).

Dimensions: Female allotype: total length 11.0, cheliceral length 4.1, cheliceral width 1.6, propeltidium length 1.6, propeltidium width 2.7, palpus length 6.5, first leg length 5.5, fourth leg length 9.0. Ratios: A/CP 3.7, genital operculum length/genital operculum width 1.5.

Female measurements (n = 3): total length 9.0–12.0, cheliceral length 2.23–2.28, cheliceral width 1.12–1.22, propeltidium length 1.38–1.4, propeltidium width 1.82–2.0, palpus length 5.5–8.0, first leg length 4.3–5.5, fourth leg length 8.9–9.7. Ratios: A/CP 5.06–5.27, genital operculum length/genital operculum width 1.5–1.52.

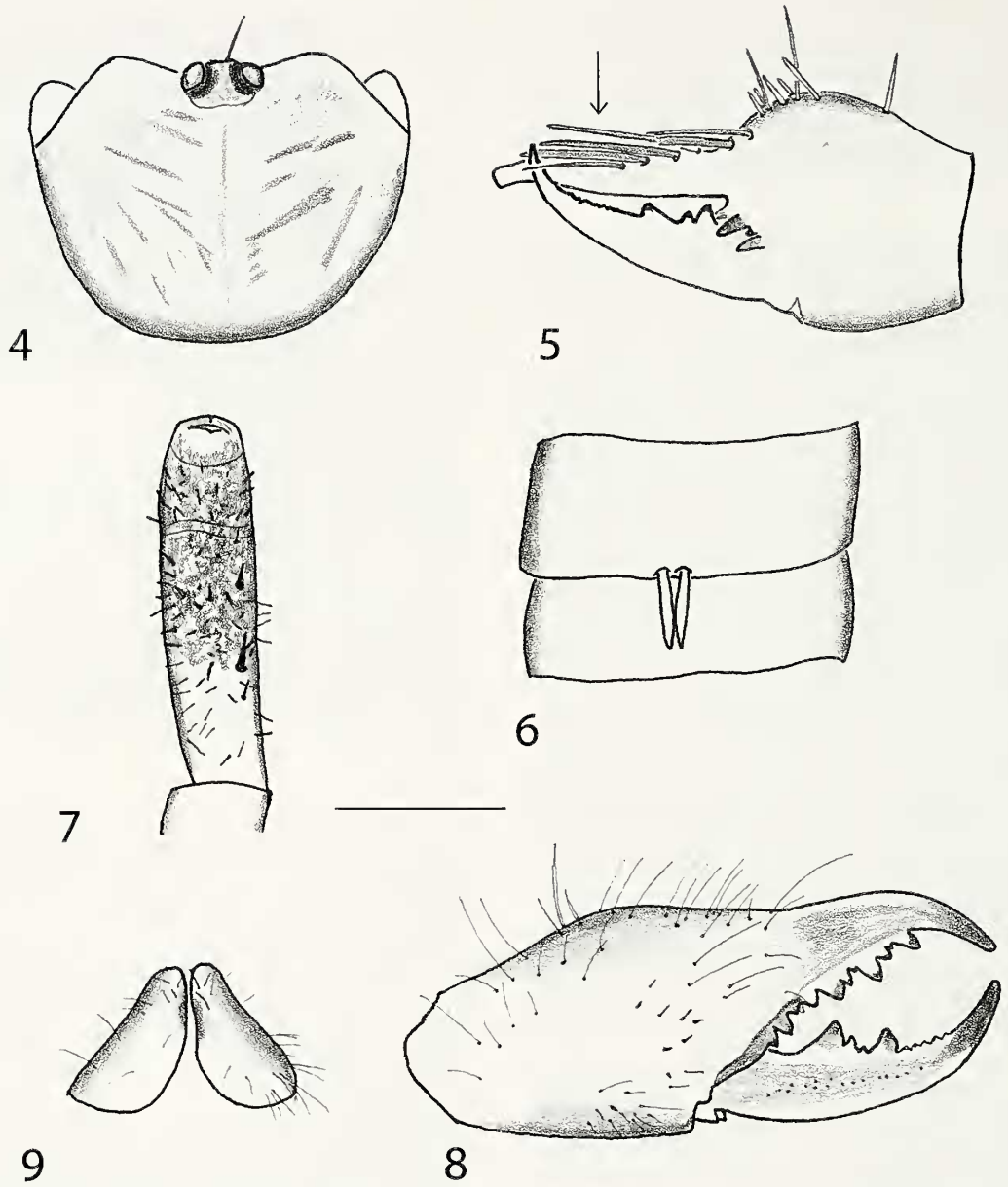
Remarks.—The distribution of this species roughly encompasses the northern area of California surrounding and including the Monterey Peninsula (Fig. 54). Muma (1951) lists female paratypes deposited at Cornell University and Utah State University (USU) but USU material is now at AMNH and the Cornell material is missing.

Hemerotrecha californica (Banks 1899)
Figs. 10–14, 54

Cleobis californica Banks 1899:314–315.
Anmotrecha californica (Banks): Banks 1900:427.
Hemerotrecha californica (Banks): Banks 1904:363.

Material examined.—*Type:* USA: *California*: female holotype, Los Angeles, Los Angeles County, A. Davidson (MCZ).

Other material: USA: *Arizona*: Mohave County: 7 ♂, 2 ♀, Virgin River Canyon, 11.3 km E. of Littlefield (36.52°N, 113.55°W), March-September 1983, D. Giuliani (ESS). *California*: Inyo County: 1 ♂, 30.6 km N. of Ridgecrest (35.62°N, 117.97°W), 5 April 1983–13 September 1983, D. Giuliani (ESS); 1 ♂, Saline Valley, Granite Canyon (35.82 °N, 116.62°W) 25 May 1981–15 April 1982, D. Giuliani (ESS); 2 ♂, White Mountains, Big Pine (37.09°N, 118.19°W), 1 November 1985–28 June 1986, D. Giuliani, (ESS); 8 ♂, 2 ♀, Sierra Nevada

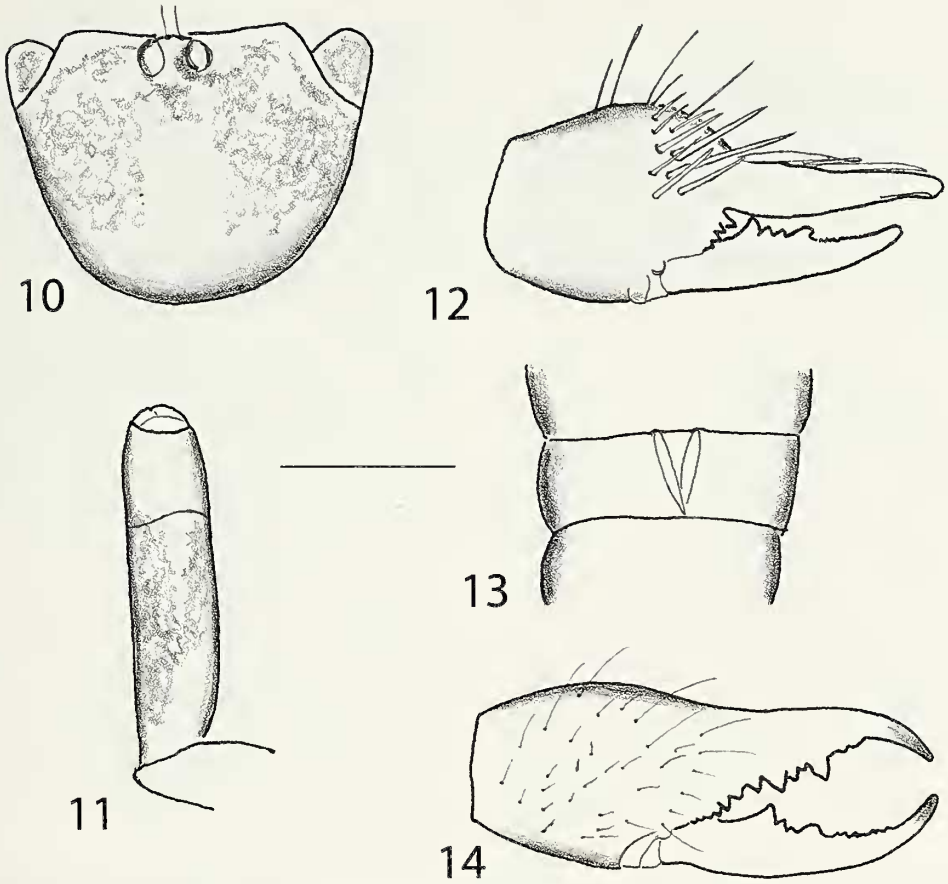


Figures 4–9.—*Hemerotrecha banksi* Muma. 4–7. Male holotype: 4. Dorsal view, propeltidium; 5. Mesal view, right chelicera showing flagella complex (arrow); 6. Ventral view, ctenidia; 7. Mesal ventral view, right palpus. 8–9. Female allotype: 8. Ectal view, chelicera; 9. Ventral view, genital operculum. Scale bar = 1 mm.

Range, 12.9 km NE. of Big Pine (37.09°N, 118.19°W), May–November 1983, D. Giuliani (ESS); 2 ♂, Bishop (37.21°N, 118.25°W), October 1985–November 1986, D. Giuliani (ESS); Los Angeles County: 1 ♂, Campo (34.14°N, 118.36°W), 23 October 1970, C. Mahrdt (CAS); 1 ♂, same data except 11 July 1971 (CAS); 1 ♂, same data except 31 July 1971 (CAS); 1 ♀, same data except 31 July 1971, H. Sunclar (CSN); 1 ♂, San Pedro (33.85°N, 118.31°W), (no date), Banks type label (MCZ #14855); 1 ♂, Chatsworth (34.26°N, 118.60°W), 1 July 1962, W.E. Icenogle (CSN); San Bernardino County: 2 ♂ Covington Flats (34.04°N, 116.31°W), June 2001, USGS, San Diego (DMNS), 1 ♂, Winchester (33.37°N, 17.15°W), 15 June 1967, W.R. Icenogle (DMNS); 3 ♂, same data except 29 June 1967 (DMNS); 1 ♀, same data except 5 May 1968 (DMNS); 1 ♂, same data except 6 June 1968 (DMNS); 1 ♂, same data except 21 May 1969 (DMNS); 1 ♂, same data except 10 May 1970 (DMNS). *Nevada*: Clark County: 2 ♂, 1 ♀, 14.5 km SW. of Overton (36.51°N, 114.32°W), March-September 1983, D. Giuliani (ESS); 3 ♂, 1 ♀, Spring Range Canyon (36.152°N, 115.88°W), March-September 1983, D. Giuliani (ESS). *New Mexico*: San Juan County: 4 ♂, 1 ♀, Shiprock (36.79°N, 108.69°W), March-September 1984, D. Giuliani (ESS).

Diagnosis.—Chelicera and propeltidium both dusky yellow-orange. Palpus dark on apical 80% of metatarsus. Fixed cheliceral finger slightly curved dorsally with a cupped mesoventral groove apically. Two long ctenidia extending length of succeeding sternite, palpus with no spine-like setae on ventral side.

Description.—*Male (from Winchester, California)*. Color: chelicera and propeltidium dusky yellow to dusky orange,



Figures 10–14.—*Hemerotrecha californica* (Banks). 10–13. Male from Winchester, California: 10. Dorsal view, propeltidium; 11. Mesal ventral view, right palpus; 12. Ectal view, right chelicera; 13. Ventral view, ctenidia. 14. Female holotype, ectal view, right chelicera. Scale bar = 1 mm.

propeltidium dusky orange to tan (Fig. 10), eye tubercle dark; abdomen lighter centrally with dusky tan blotches ectally, palpal metatarsus dark to dusky on apical 80% (Fig. 11); leg I pale, legs II, III, IV faintly tan dorsally.

Chelicera: fixed finger with a shallow cup-like mesal ventral groove apically but otherwise normally rounded at the tip; no dorsal ridge, movable finger with a more flattened, triangular shaped anterior tooth; 2 intermediate teeth, posterior intermediate tooth separated from primary tooth; a small but discernable fondal noteh (Fig. 12); flagellar complex typical of the group.

Abdomen: two ctenidia extending length of succeeding sternite (Fig. 13). Edges of malleoli darkly tinged.

Palp: many hair-like setae but no spines (Fig. 11).

Dimensions: (n=4): total length 8.0–9.0, cheliceral length 2.22–4.0, cheliceral width 0.95–1.9, propeltidium length 1.22–1.3, propeltidium width 1.76–2.1, palpus length 6.0–8.0, first leg length 4.8–7.0, fourth leg length 8.5–10.5. *Ratios*: A/CP 4.8–6.1, cheliceral width/fixed finger width 3.9–4.4.

Females.—Color: holotype lighter than male description but most other females the same coloration as males.

Chelicera: similar to *H. banksi* but posterior intermediate tooth is imperceptively to visibly separated from primary tooth (Fig. 14).

Genital region: typical, perhaps more flattened on the posterior margin.

Female allotype: total length 12, cheliceral length 3.8, cheliceral width 1.4, propeltidium length 1.6, propeltidium width 2.6, palpus length 6.5, first leg length 5.5, fourth leg length 9.5. *Ratios*: A/CP 4.4, 2.7, 0.62, genital operculum length/genital operculum width 1.6.

Female measurements (n=4): total length 8.0–14.0, cheliceral length 2.5–3.5, cheliceral width 0.92–1.4, propeltidium length 1.31, propeltidium width 1.6–1.91, palpus length 5.2–6.0, first leg length 4.5–5.5, fourth leg length 8.5–12.0. *Ratios*: A/CP 4.7–4.84, genital operculum length/genital operculum width 1.4–1.6.

Remarks.—Muma (1951) provides a description of a male *H. californica*. Based on the locality information he provides for examined specimens, this description was based upon a male collected from Starbucks, Washington. The color pattern of the propeltidium and chelicerae indicate that this male actually represents *H. hanfordana*, new species. Our identification for this group is based on the length and shape of the male ctenidia as well as the shape of the male fixed finger, particularly the tip. The distribution of *H. californica* includes the coastal region from Los Angeles to San Diego across southern California, into parts of Nevada and into northwestern New Mexico. This is in stark contrast to the patchy distribution of other members of this group. However, this wide distribution is not unusual among other solifuges, i.e., *Eremobates nodularis* Muma 1951, *Eremochelis bilobatus*

(Muma 1951), *Hemerotrecha fruitana* Muma 1951 (Brookhart & Brookhart 2006).

Hemerotrecha hanfordana new species
Figs. 15–20, 54

Material examined.—USA: *Washington*: male holotype, Hanford National Monument, Wahluke Wildlife Area, White Bluffs Ferry, Franklin County (46.41°N, 119.47°W) 5–12 July 2002, R.S. Zack (DMNS). Female allotype, 2 male and 2 female paratypes, collected with holotype (DMNS); 3 male, 1 female paratypes (WSU).

Other material: USA: *California:* Siskiyou County: 2 ♂, Macdoel (41.83°N, 122.35°W), 6 July 1968, J. Schuh (AMNH); *Nevada*: Washoe County: 1 ♂, Wadsworth (39.66°N, 119.29°W), 23 July 1965, B. Opler (ESS); *Utah*: Box Elder County: 1 ♂, Lucin (41.35°N, 113.90°W), 19 June 1952, D.E. Beck (BYU); 10 ♂, 5 ♀, Key Springs Rd. (41.601°N, 113.891°W, 2 June–2 July 2007, A. Spriggs & Joey Slowik (DMNS); Tooele County: 1 ♂, Dugway Proving Grounds (dunes) (44.48°N, 123.36°W), no name (BYU); *Washington*: Benton County: 8 ♂, 4 ♀, Hanford Nuclear Site (46.32°N, 119.31°W), Rattlesnake Mountain (46.40°N, 119.61°W), 21 June–13 Aug 2002, R.S. Zack (WSU); 1 ♂, Rattlesnake Spring (46.50°N, 119.71°W), 1–9 July 2002, R.S. Zack (WSU); Grant County: 6 ♂, 4 ♀, Saddle Mountain National Wildlife Refuge (46.68°N, 119.63°W), 14 June–23 July 2002, R.S. Zack (WSU).

Etymology.—The species name is an adjective referring to the type locality.

Diagnosis.—*Hemerotrecha hanfordana* has both darkly colored chelicera and propeltidium; palpus dark on metatarsus; two short, flat, pointed ctenidia separate it from both *Hemerotrecha kabooni*, new species and *Hemerotrecha californica*, which have longer, thinner ctenidia. *Hemerotrecha banksi* also has darkly colored palpal tarsi.

Description.—*Male*, Color: base coloration a blotchy black, with lighter colored patches on the posterior median propeltidium, mesopeltidium, and metapeltidium. Chelicera and propeltidium both blotchy black (Figs. 15, 16); palpal metatarsus blotchy black (Fig. 18), leg I dusky on tibia and metatarsus, legs II, III, IV dark on the dorsal, ectal regions of coxa, femur, tibia, tarsus, and metatarsus.

Chelicera: fixed finger with small ridge basally on the dorsal edge, and a slightly hooked tip, ventral edge smooth with a short, deep mesal ventral groove apically (arrow, Fig. 16). Two specimens had very tiny denticles. Movable finger with large primary tooth, two intermediate teeth, and anterior tooth, posterior intermediate tooth is separate from primary tooth and fondal notch obscure to absent; fondal teeth graded I, III, II, IV (Figs. 16, 17).

Abdomen: two flat, pointed ctenidia extending across half of the succeeding abdominal segment (Fig. 19).

Palp: palpi with 2–4 thick spine-like setae ventrally (Fig. 18).

Dimensions: *Male holotype:* total length 11.5, cheliceral length 2.5, cheliceral width 1.1, propeltidium length 1.3, propeltidium width 2.0, palpus length 7.0, first leg length 6.0, fourth leg length 12.5. *Ratios*: A/CP 6.65, cheliceral width/fixed finger width 4.13.

Male paratypes (5): total length 11.5–13.0, cheliceral length 2.33–2.67, cheliceral width 1.05–1.1, propeltidium length 1.33–1.55, propeltidium width 1.77–2.0, palpus length 6.0–8.0, first leg length 5.0–6.5, fourth leg length 10.0–12.5. *Ratios*: A/CP 5.59–6.65, cheliceral width/fixed finger width 3.20–4.13.

Females: coloration as in males.

Chelicera: fixed finger with primary tooth, medial tooth, anterior tooth, with two intermediate teeth between each. Movable finger with primary tooth, anterior tooth, and two intermediate teeth. Posterior intermediate tooth in notch of primary tooth (Fig. 20).

Genital region: typical configuration for the group.

Dimensions: *Female allotype:* total length 11.0, cheliceral length 2.67, cheliceral width 0.85, propeltidium length 1.4, propeltidium width 1.85, palpus length 6.0, first leg length 5.0, fourth leg length 8.0. *Ratios*: A/CP 4.67, genital operculum length/genital operculum width 2.40. *Female paratypes (3)*: total length 11.0–13.0, cheliceral length 2.7–3.6, cheliceral width 0.85–1.46, propeltidium length 1.4–1.87, propeltidium width 1.85–2.6, palpus length 6.0–8.0, first leg length 5.0–7.0, fourth leg length 8.0–14.0. *Ratios*: A/CP 2.3–4.7, genital operculum length/genital operculum width 1.7–2.4.

Remarks.—The male of *H. californica* described by Muma (1951) was probably a member of this species. *Hemerotrecha hanfordana* is found in xeric regions of the Basin and Range system and extends into both northeastern California and northwestern Utah. This roughly corresponds with the distribution of *Eremochelis bidipressus* Muma 1951 and another *Hemerotrecha*, *H. denticulata* Muma 1951 (Brookhart & Brookhart 2006).

Hemerotrecha kabooni new species
Figs. 21–26, 54

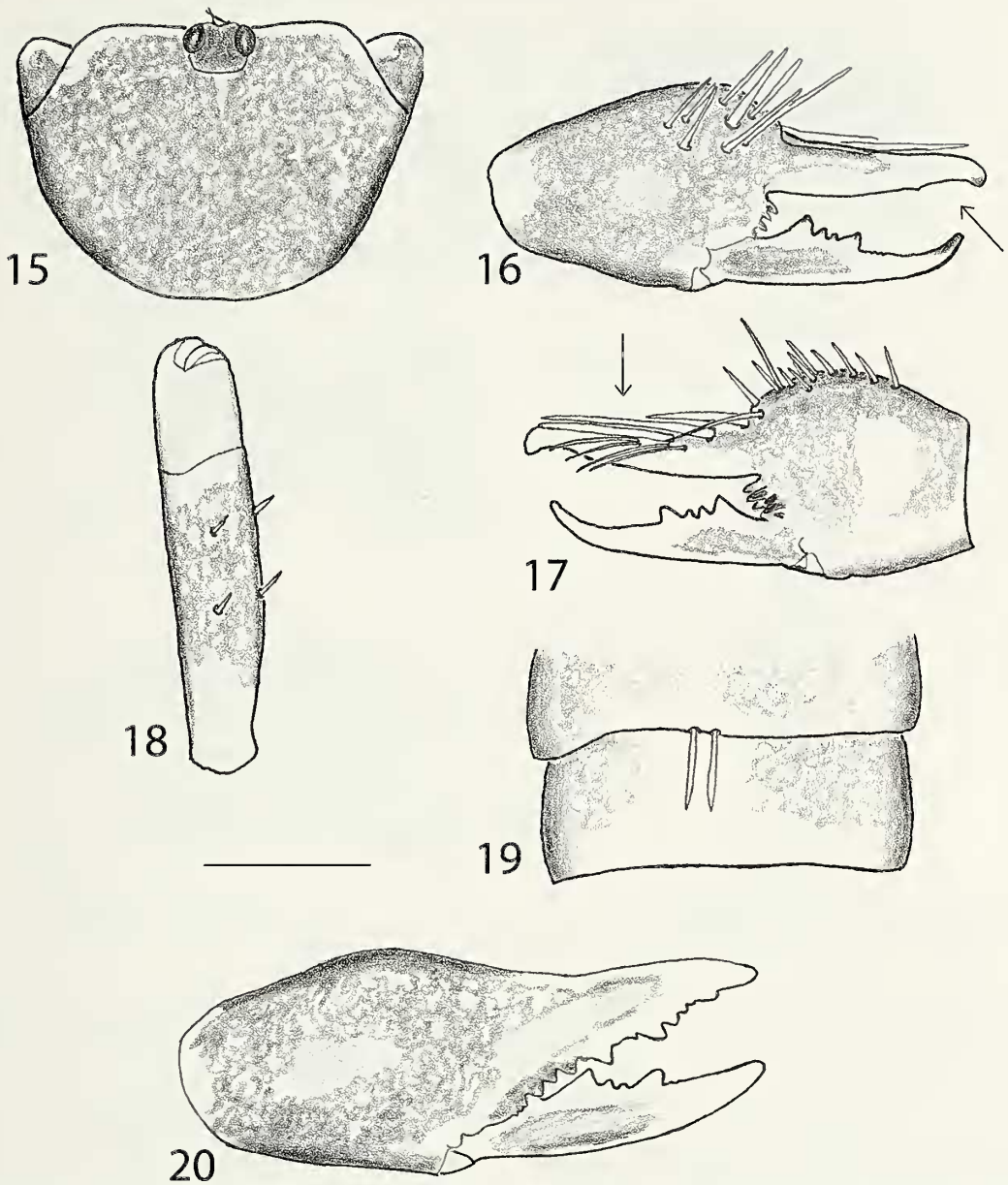
Material examined.—*Types:* USA: *Nevada*: Nye County: male holotype, Mercury, 25 July 1960, Atomic Energy Commission and Brigham Young University (AMNH). Female allotype, same data as holotype except 22 June 1960 (AMNH). Paratypes: 6 males, 6 females, same data as holotype except 6 June–20 July 1960 (AMNH).

Other material examined: USA: *Nevada*: Clark County: 1 ♀, Mercury, Nevada Test Site (36.94°N, 116.32°W), 6 June 1960, Atomic Energy Commission and Brigham Young University (AMNH); 1 ♀, same data except 11 June 1960 (AMNH); 1 ♂, same data except 20 June 1960 (AMNH); 1 ♀, same data except 30 June 1960 (AMNH); 1 ♀, 22 June 1960 (AMNH); 1 ♂, same data except 2 July 1960 (AMNH); 1 ♂, same data except 8 July 1960 (AMNH); 1 ♂, same data except 11 July 1960 (AMNH); 1 ♂, same data except 13 July 1960 (AMNH); ♂, same data except 25 July 1960 (AMNH).

Etymology.—The specific name refers to the explosion of the first nuclear device at the Nevada Test Site. It is to be treated as a noun in apposition.

Diagnosis.—This species is most similar to *H. hanfordana* and *H. banksi*. It differs from *H. hanfordana* in the coloration of the chelicera with *H. hanfordana* dusky dark while *H. kabooni* is dusky orange and from *H. banksi* in the shape of the cheliceral fixed finger. *Hemerotrecha kabooni* has a ventral curvature and a small hook apically while *H. banksi* has a rounded tip. The ctenidia are longer than either of the above species.

Description.—*Male:* chelicera dusky orange, dusky to dark mottled propeltidium (Fig. 21), and slightly lighter colored



Figures 15–20.—*Hemerotrecha hanfordana*, new species. 15–19. Male holotype: 15. Dorsal view, propeltidium; 16. Ectal view, right chelicera showing anterior concavity (arrow); 17. Mesal view, right chelicera showing flagellum complex (arrow); 18. Mesal ventral view, right palpus; 19. Ventral view, ctenidia. 20. Female holotype, ectal view, right chelicera. Scale bar = 1 mm.

abdomen, leg I dusky on metatarsus only; legs II, III, IV dusky ventrally.

Chelicera: fixed finger with a slight hook; the ventral apical concavity of the fixed finger shallow and extended, anterior tooth of movable finger triangular; posterior intermediate tooth separate from primary tooth; fondal notch obscure or absent (Fig. 22).

Abdomen: ctenidia extending entire length of succeeding sternite (Fig. 24).

Palp: with 2–3 spine-like setae ectal ventrally (Fig. 23).

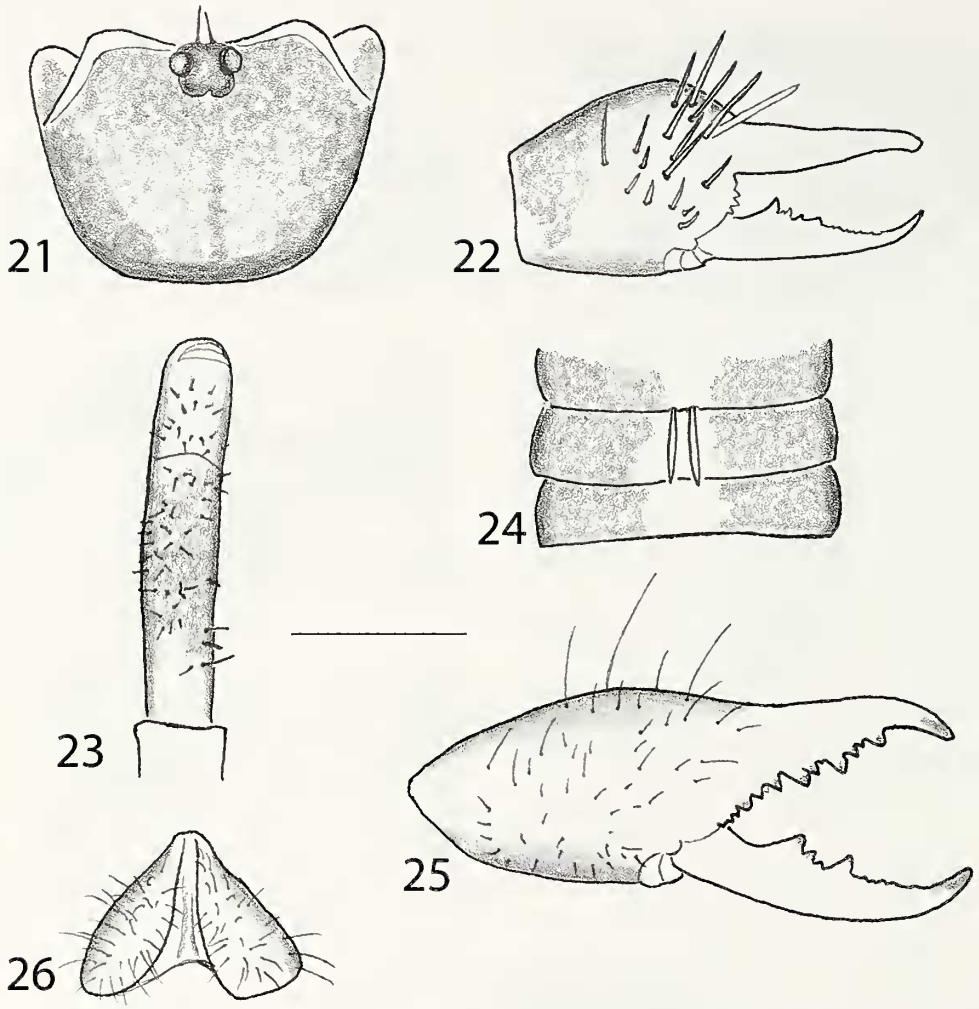
Male holotype: total length 10.5, cheliceral length 2.65, cheliceral width 1.12, propeltidium length 1.52, propeltidium width 1.9, palpus length 7.0, first leg length 6.0, fourth leg length 12.5. *Ratios*: A/CP 6.12, chelicera width/fixed finger width 4.48. *Male paratypes (6)*: total length 8.5–10.0, cheliceral length 2.16–2.40, cheliceral width 0.87–1.0, propeltidium length 1.07–1.33, propeltidium width 2.02–2.40, palpus length 4.0–6.5, first leg length 5.0–6.0, fourth leg length 8.5–9.5. *Ratios*: A/CP 5.18–5.97, cheliceral width/fixed finger width 3.25–3.75.

Females: coloration as in males.

Chelicera: typical for the females of this group (Figs. 7, 13, 24).

Genital region: typical of the group but with narrower arms and a more rounded posterior margin (Fig. 26).

Dimensions: Female allotype: total length 9.5, cheliceral length 3.0, cheliceral width 1.67, propeltidium length 1.18, propeltidium width 1.95, palpus length 5.0, first leg length 5.5, fourth leg length 6.5. *Ratios*: A/CP 4.07, genital operculum length/genital operculum width 1.67.



Figures 21–26.—*Hemerotrecha kaboomi*, new species. 21–24. Male holotype: 21. Dorsal view, propeltidium; 22. Ectal view, chelicera; 23. Mesal ventral view, palpus; 24. Ventral view, ctenidia. 25–26. Female allotype: 25. Ectal view, right chelicera; 26. Ventral view, genital operculum. Scale bar = 1 mm.

Female paratypes (6): total length 9.5–11.5, cheliceral length 2.7–3.2, cheliceral width 0.9–1.67, propeltidium length 1.18–1.45, propeltidium width 1.75–2.25, palpus length 5.0–5.5, first leg length 5.0–6.0, fourth leg length 6.5–7.5. *Ratios*: A/CP 4.0–4.4, genital operculum length/genital operculum width 1.4–2.0.

Remarks.—Females of *H. kaboomi* were collected early in June, males in July, all in dry pitfalls as part of the survey of the Nevada Test Site. Allred et al. (1963) considered this area as the boundary between the Mohave Desert and the Great Basin geographic provinces.

Hemerotrecha marginata (Kraepelin 1911)
Figs. 27–30, 54

Eremobates marginatus Kraepelin 1911:103–105, figs. 4a–b.
Eremognatha marginata (Kraepelin): Roewer 1934:569, figs. 116c, 128, 324p, 327c.
Hemerotrecha marginata (Kraepelin) Muma 1951:102, figs. 198–201; Muma 1970:38, figs. 32–35.

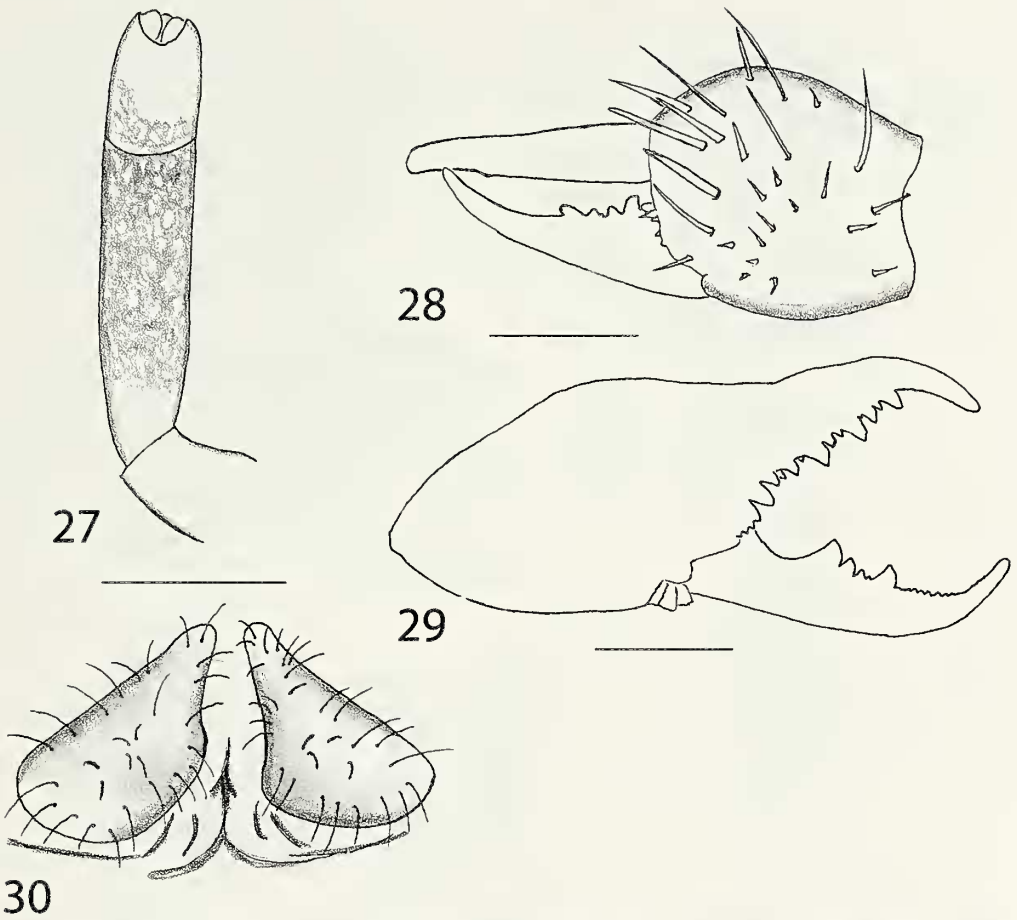
Material examined.—*Types:* USA: *California*: Los Angeles County: male holotype, San Pedro (33.74°N, 118.29°W), 5 June 1867 (ZSM, Roewer type #8376). Female allotype: same data as holotype (ZSM). Paratypes: 1 male, 1 female, same data as holotype (ZSM).

Other material.—USA: *California:* Inyo County: 1 ♂, Paxton Sand Dunes, 13 April–29 September 1982, E. Giuliani (ESS); Riverside County: 1 ♀, Banning (33.96°N, 116.89°W), April 1995, J.W. McSwain (ESS); San Bernardino County: 1 ♂, Granite Cove (34.78°N, 115.66°W), Interstate 40 & Kalbake Road, E. Fessler (UCR).

Diagnosis.—*Hemerotrecha marginata* is separated from *H. californica*, which it most closely resembles, by the coloration of chelicera, propeltidium, and eye tubercle, which are pale yellow. Palpus with metatarsus and distal 20% of tarsus dusky; ctenidia extend half way across succeeding sternite.

Description.—*Male:* Color: chelicera, propeltidium including eye tubercle, pale yellow. Palpus pale yellow with metatarsus and distal 60% of tarsus dusky (Fig. 27); legs mostly pale, slightly dusky on ventral side of femur of legs III, IV, abdomen mottled, ctenidia extend halfway across succeeding sternite.

Chelicera: typical for the group with only a slight apical hook. Fixed finger regularly curved without teeth, shallow cup like mesal ventral groove apically, movable finger with normal



Figures 27–30.—*Hemerotrecha marginata* (Kraepelin). 27–28. Male holotype: 27. Mesal ventral view, right palpus; 28. Ectal view, left chelicera. 29–30. Female allotype: 29. Ectal view, right chelicera; 30. Ventral view, genital operculum. Scale bars = 1 mm.

primary tooth, flat pointed anterior tooth, 1–2 intermediate teeth separated from primary tooth. Base of fixed finger as wide as the base of movable finger. Fond indistinct, fondal teeth graded I, III, II, IV ectally and mesally (Fig. 28).

Abdomen: two thin ctenidia extending halfway across succeeding sternite.

Palp: without spine-like setae (Fig. 27).

Dimensions: *Male holotype:* total length 10.0, cheliceral length 2.34, cheliceral width 1.21, propeltidium length 1.3, propeltidium width 1.7, palpus length 5.57, first leg length 5.5, fourth leg length 8.5. *Ratios*: A/CP 5.38, cheliceral width/fixed finger width 3.46.

Males (4): total length 8.0–11.0, cheliceral length 2.1–2.45, cheliceral width 1.05–1.3, propeltidium length 0.8–1.5, propeltidium width 1.3–1.8, palpus length 4.0–6.2, first leg length 4.5–6.1, fourth leg length 6.5–9.3. *Ratios*: A/CP 5.20–5.45, genital operculum length/genital operculum width 3.0–3.5.

Females: Coloration: same as in males.

Chelicera: typical for females of the group (Fig. 29).

Genital region: club shaped (Fig. 30).

Dimensions: *Female allotype:* total length 9.0, cheliceral length 2.3, cheliceral width 0.9, propeltidium length 1.2, propeltidium width 1.85, palpus length 5.0, first leg length 4.5, fourth leg length 7.0. *Ratios*: A/CP 4.70, genital operculum length/genital operculum width 1.70.

Females (2): length 8.5–9.0, cheliceral length 2.2–2.7, cheliceral width 0.86–1.0, propeltidium length 1.05–1.46. propeltidium width 1.73–1.9, palpus length 4.0–5.4, first leg length 3.7–4.5, fourth leg length 5.8–7.4. *Ratios:* A/CP 3.6–4.7, genital operculum length/genital operculum width 1.67–1.70.

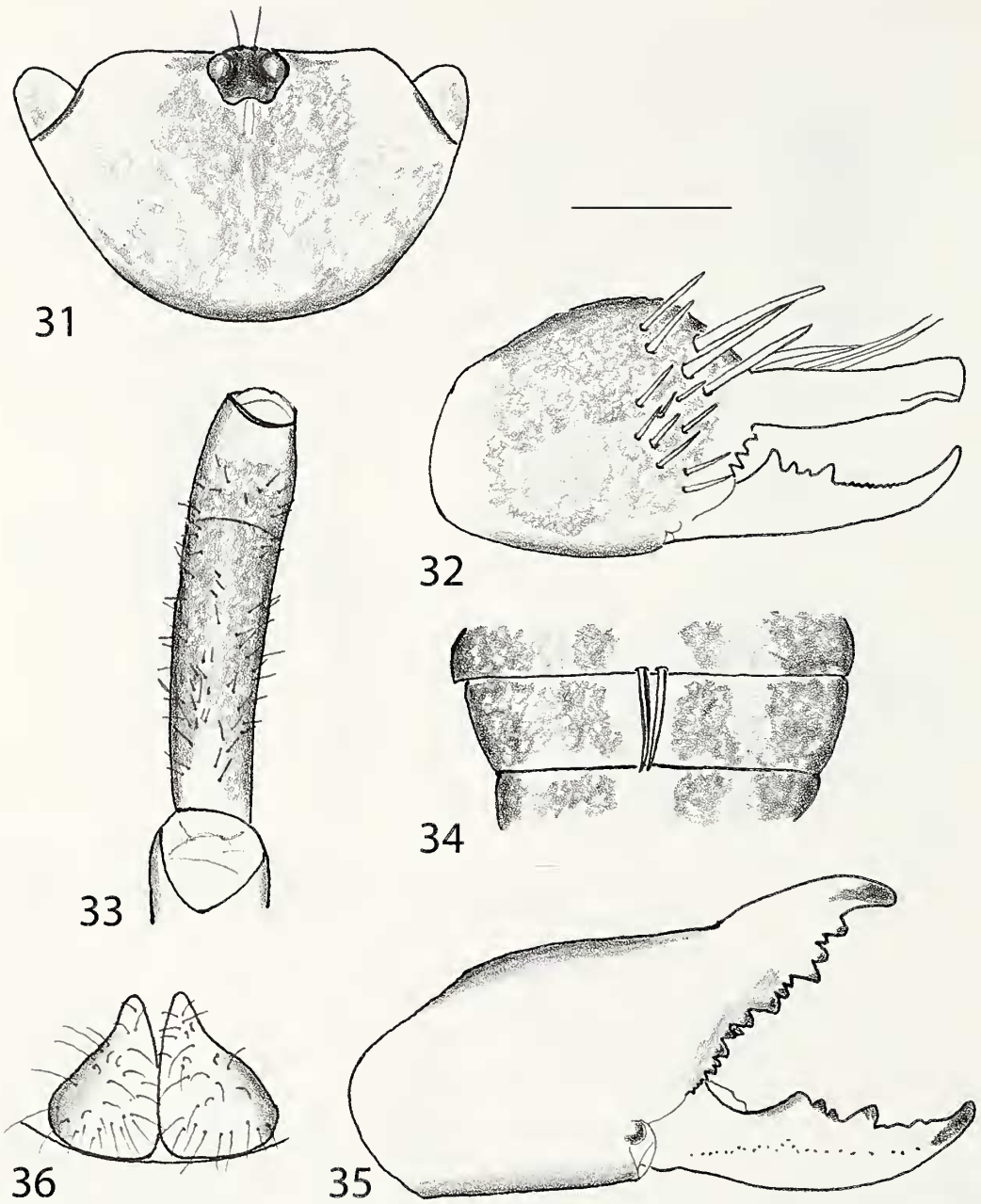
Remarks.—The illustration of the ctenidia provided by Muma (1951) was based on the drawing published by Kraepelin (1911). Muma (1970) re-drew the ctenidia based upon examination of the type specimen. In both the 1951 and the 1970 drawings, Muma illustrates three ctenidia found on the type specimen. However, in the 1970 publication, Muma assumed that it possessed four ctenidia, and that one had simply broken off. The males that we examined consistently had but two ctenidia as do all others of this group.

Hemerotrecha truncata Muma 1951
Figs. 31–36, 54

Hemerotrecha truncata Muma 1951:102, fig. 197; Muma 1970:41.

Material examined.—*Type:* USA: *California*: Tulare County: male holotype, Exeter (36.3°N, 119.14°W), 16 May 1909, C. L. Fox (AMNH).

Other material: USA: *California*: Inyo County: 1 ♂, Whippoorwill Canyon (37.00°N, 117.94°W), May 1983–June 1984, D.Giuliani (CA); Stanislaus County: 2 ♂, 1 ♀, Lagrange



Figures 31–36.—*Hemerotrecha truncata* Muma. 31–34. Male holotype: 31. Dorsal view, propeltidium; 32. Ectal view, right chelicera; 33. Mesal ventral view, right palpus; 34. Ventral view, ctenidia. 35–36. Female: 35. Ectal view, right chelicera; 36. Ventral view, genital operculum. Scale bar = 1 mm.

(37.67°N, 120.46°W), 27 May 1976, J. Collins (CAS); 2 ♂, 1 ♀, Turlock (37.5°N, 120.85 W), 2 June 1976, J. Collins (CAS); Tulare County: 1 ♂, 1 ♀, Kaweah (36.47°N, 118.92°W), 13 May 1963, J. Boswell (ESS).

Diagnosis.—This species is easily distinguished by the parrot-beak shaped hook on the tip of male fixed finger. Specimens are darkly colored.

Description.—*Males:* Color: chelicera dusky to dark yellow, propeltidium and abdomen chocolate brown (Fig. 31), palpal tarsus, metatarsus, tip of tibia darkly colored (Fig. 32); all legs dark to dusky brown; eye tubercle dark.

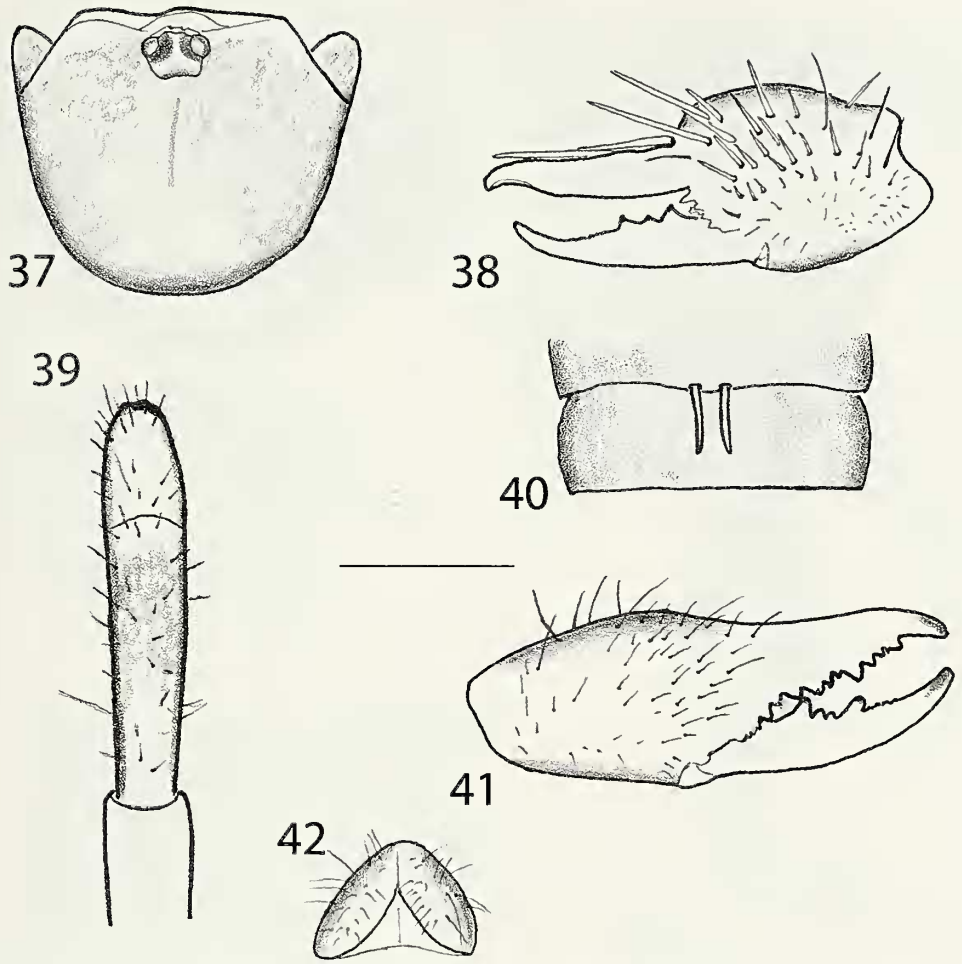
Chelicera: fixed finger sharply hooked (parrot beak) with deep cup-like mesal ventral groove apically, no dorsal trough/ridge. Dentition typical of the group with posterior intermediate tooth of movable finger separate from primary tooth (Fig. 32).

Abdomen: two long, thin ctenidia extending the length of the succeeding sternite (Fig 34).

Palp: as in Fig. 33.

Dimensions: *Male holotype:* total length 11.0, cheliceral length 3.1, cheliceral width 1.4, propeltidium length 2.01, propeltidium width 2.8, palpus length 9.0, first leg length 7.0, fourth leg length 13.5. *Ratios*: A/CP 5.77, cheliceral width/fixed finger 4.24.

Male paratypes (7): total length 7.5–11.0, cheliceral length 2.0–2.5, cheliceral width 0.8–1.5, propeltidium length 0.9–2.0,



Figures 37–42.—*Hemerotrecha pseudotruncata*, new species. 37–40. Male holotype: 37. Dorsal view, propeltidium; 38. Ectal view, left chelicera; 39. Dorsal view, right palpus; 40. Ventral view, ctenidia. 41–42. Female allotype: 41. Ectal view, right chelicera; 42. Dorsal view, genital operculum. Scale bar = 1 mm.

propeltidium width 1.5–2.8, palpus length 6.5–9.0, first leg length 4.5–7.0, fourth leg length 6.5–9.0. *Ratios*: A/CP 5.7–6.8, cheliceral width/fixed finger width 2.8–4.2.

Female: coloration as in the male.

Chelicera: typical of the group except posterior intermediate tooth of the movable finger is on the notch of the primary tooth (Fig. 35);

Palp: three pair of spine-like setae on ventral margin of metatarsus.

Genital region: typical of the group (Fig. 36).

Female measurements (2): total length 12.0–13.0, cheliceral length 3.3–3.6, cheliceral width 1.35–1.46, propeltidium length 1.44–1.86, propeltidium width 2.5–2.6, palpus length 7.0–8.0, first leg length 6.5–7.0, fourth leg length 12.5–14.5. *Ratios*: A/CP 5.0–5.7, genital operculum length/genital operculum width 1.7–1.8.

Remarks.—This very distinctive member of the *H. banksi* group inhabits the Mohave Desert Region of eastern California.

Hemerotrecha pseudotruncata new species
Figs. 37–42, 54

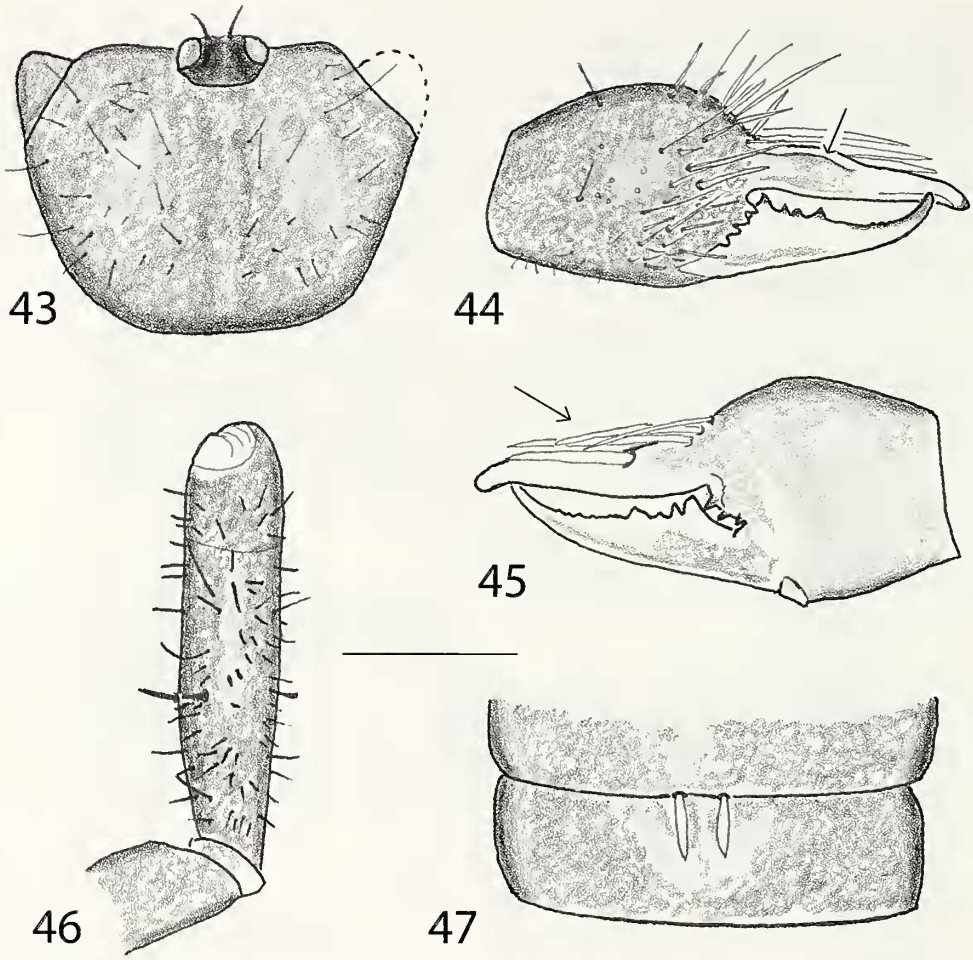
Material examined.—USA: *Nevada*: Nye County: male holotype Monitor Summit (38.8°N, 115.5°W), 27.3 km E. of Tonapah, October 1982–September 1983, D. Giuliani (ESS); female allotype: Currant Summit, 16.1 km E. of Currant, October 1982–September 1983, D. Giuliani (ESS).

Other material: USA: *California:* Inyo County: China Lake 3 ♂, 1 ♀, Death Valley Deep Springs (37.37°N, 117.98°W), May 1983–June 1984, D. Giuliani (CAS); 1 ♂, Fish Lake Valley, Waucoba Spring (36.7°N, 116.84°W), May–October 1983, D. Giuliani (CAS); 3 ♂, 1 ♀, Saline Range (coordinates not possible), March 1979–May 1983, D. Giuliani (CAS); *Nevada*: Esmeralda County 1 ♂, 8 km SW Lida (37.321°N, 117.8°W); Nye County: 1 ♂, 1 ♀, Grapevine Mountains, Phinney Canyon (36.99°N, 117.03°W), March–September 1983, D. Giuliani (CAS); 1 ♂, Monitor Summit (38.05°N, 117.22°W), October 1982–September 1983, D. Giuliani (CAS); 1 ♂, 1 ♀, Currant Summit (38.74°N, 115.47°W), March–September 1983, D. Giuliani (CAS).

Etymology.—The species name refers to the modified hook at the tip of male fixed finger, which is similar to *H. truncata* but not as radically modified.

Diagnosis.—This species differs from *H. truncata* by having less radical hook-like tip on the male fixed finger, slightly broader and shorter ctenidia, and slightly lighter coloration.

Description.—*Male:* chelicera dusky orange, propeltidium dusky (Fig. 37), palpi usually dark to dusky on apical 80% of



Figures 43–47.—*Hemerotrecha vetteri*, new species, male holotype: 43. Dorsal view, propeltidium; 44. Ectal view, right chelicera (arrow denotes dorsal ridge); 45. Mesal view, right chelicera (arrow denotes flagella complex); 46. Mesal ventral view, right palpus; 47. Ventral view, ctenidia. Scale bar = 1 mm.

metatarsus (Fig. 39), eye tubercle dark, legs dark to dusky ventrally.

Chelicera: with sharp hook apically but not nearly as prominent as in *H. truncata*, a short, deep concave cup-like mesal ventral groove apically, anterior ventral edge concave, movable finger with large primary tooth, smaller anterior tooth, single intermediate tooth separated from primary tooth, crenulations on the anterior dorsal edge; obscure to small fondal notch (Fig. 38).

Abdomen: two pointed ctenidia extending about one half the length of succeeding sternite (Fig. 40).

Palp: 2–3 spine-like setae on ventral metatarsus (Fig. 39).

Male holotype: total length 8.5, cheliceral length 2.1, cheliceral width 1.0, propeltidium length 1.1, propeltidium width 1.4, palpus length 8.6, first leg length 5.5, fourth leg length 7.0. *Ratios*: A/CP 6.6, cheliceral width/fixed finger width 3.78.

Male paratypes (n=8): total length 8.0–10.0, cheliceral length 1.9–2.7, cheliceral width 0.76–1.0, propeltidium length 1.0–1.36, propeltidium width 1.3–1.8, palpus length 8.0–10.5, first leg length 5.0–6.5, fourth leg length 6.0–7.0. *Ratios*: A/CP 6.4–6.5, cheliceral width/fixed finger width 3.33–4.1.

Female: coloration as in males.

Chelicera: typical for females of this group (Fig. 41).

Genital region: smaller and more oval than other members of this group (Fig. 42).

Dimensions: Female allotype: total length 8.0, cheliceral length 2.6, cheliceral width 0.9, propeltidium length 1.33, propeltidium width 1.76, palpus length 5.0, first leg length 5.0, fourth leg length 6.5. *Ratios*: A/CP 3.1, genital operculum length/genital operculum width 0.8.

Female (n=4)*:* total length 8.0–8.5, cheliceral length 2.8–3.0, cheliceral width 1.0, propeltidium length 1.4–1.55, propeltidium width 1.65–1.8, palpus length 5.5–5.8, first leg length 5.5–6.0, fourth leg length 6.5–7.0. A/CP 3.8–4.0, genital operculum length/genital operculum width 0.8–0.9.

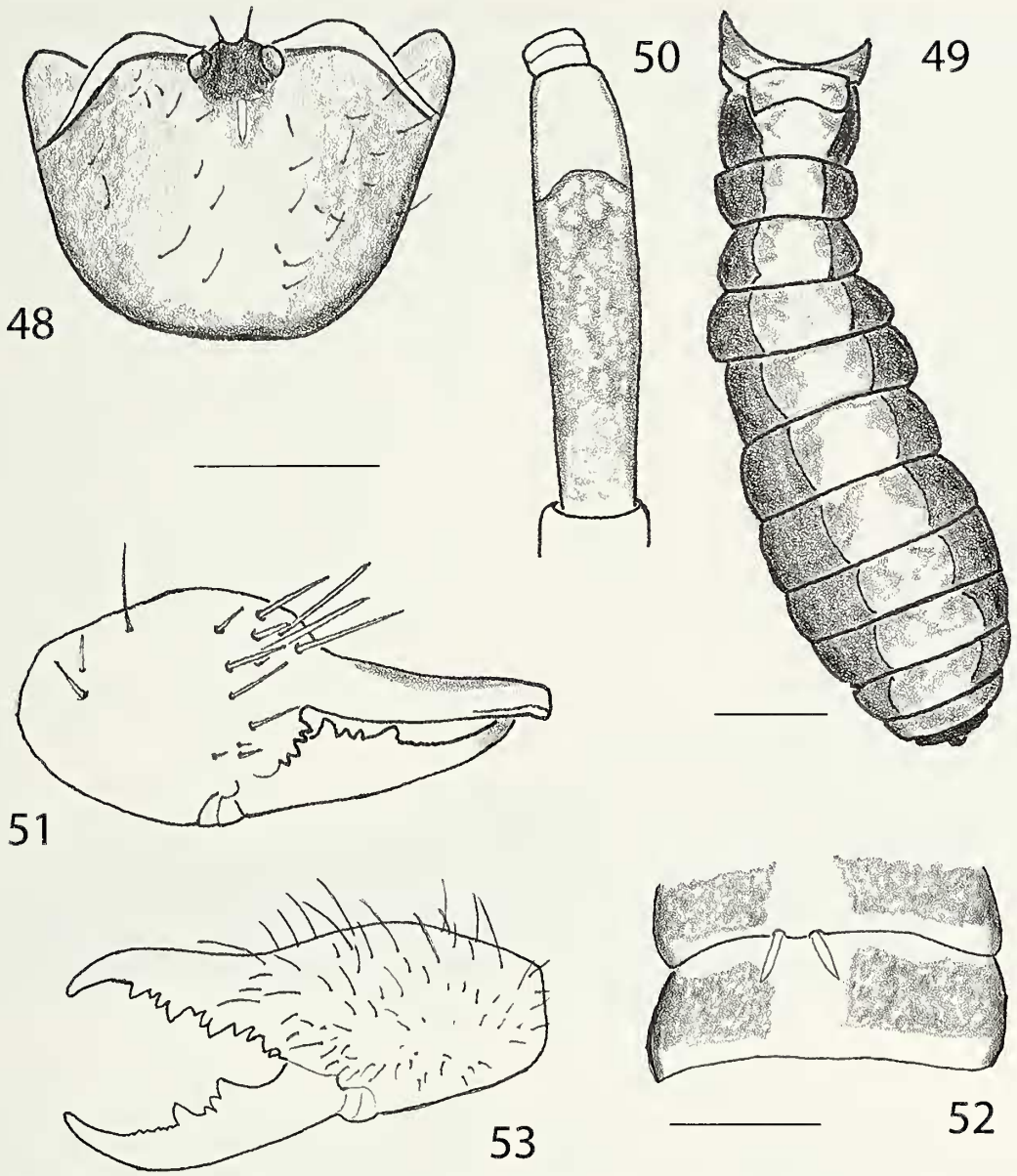
Remarks.—*Hemerotrecha pseudotruncata* seems closely related to *H. truncata.*

Hemerotrecha vetteri new species

Figs. 43–47, 54

Material examined.—*Type:* USA: *California*: Santa Barbara County: male holotype, Vandenburg Air Force Base (34.76°N, 120.46°W), 30 April 2004, Abela, Pierce, Pratt (DMNS).

Etymology.—This species is named for the inveterate invertebrate collector and arachnologist, Rick Vetter, who sent this and many other specimens for examination.



Figures 48–53.—*Hemerotrecha prenticei*, new species. 48–51. Male holotype: 48. Dorsal view, propeltidium; 49. Dorsal view, abdomen; 50. Dorsal view, right palpus; 51. Ectal view, right chelicera. 52. Ventral view, male ctenidia. 53. Ectal view, female chelicera. Scale bars = 1 mm.

Diagnosis.—This totally dark species is most similar to *H. banksi* except for its completely dark coloration. The presence of the dorsal, trough-like structure on the cheliceral fixed finger is unique to the group. Females unknown.

Description.—*Male:* Color: total body dark with no light patches (Fig. 43). Appendages dark over entire length.

Chelicera: similar to *H. banksi* with a short, small ventral concavity anteriorly. A highly visible ridge on the distal, ventral margin of fixed finger. Fondal notch absent or obscure, posterior intermediate tooth of movable finger separate from primary tooth (Figs. 44, 45).

Abdomen: ctenidia short, pointed, and extending about halfway across succeeding abdominal segment (Fig. 47).

Palp: several spine-like setae on mesal ventral side (Fig. 46).

Male holotype: total length 11.0, cheliceral length 2.7, cheliceral width 1.2, propeltidium length 1.4, propeltidium width 2.1, palpus length 7.0, first leg length 4.5, fourth leg length 10.0. *Ratios*: A/CP 6.14, cheliceral width/fixed finger width 3.2.

Remarks.—No females are known at present.

Hemerotrecha prenticei new species
Figs. 48–52, 54

Material examined.—USA: *California*: male holotype from Southwest Riverside County Multispecies Reserve (Lake Skinner), Riverside County (33.38°N, 117.00°W), 9–12 May 2000, Tom Prentice (DMNS). Female allotype: collected from same site, 15–18 May 2000 (DMNS). Paratypes: 4 males, 2 females, collected from same site, various dates (DMNS); 4 males, 1 female, collected from same site, various dates (UCR).

Other material: USA: *California:* Kern County, 1♂, 1♀, Dove Springs (35.42°N, 118.00°W) June 2003, collected by the United States Geological Survey, San Diego Office; 4 ♂, same

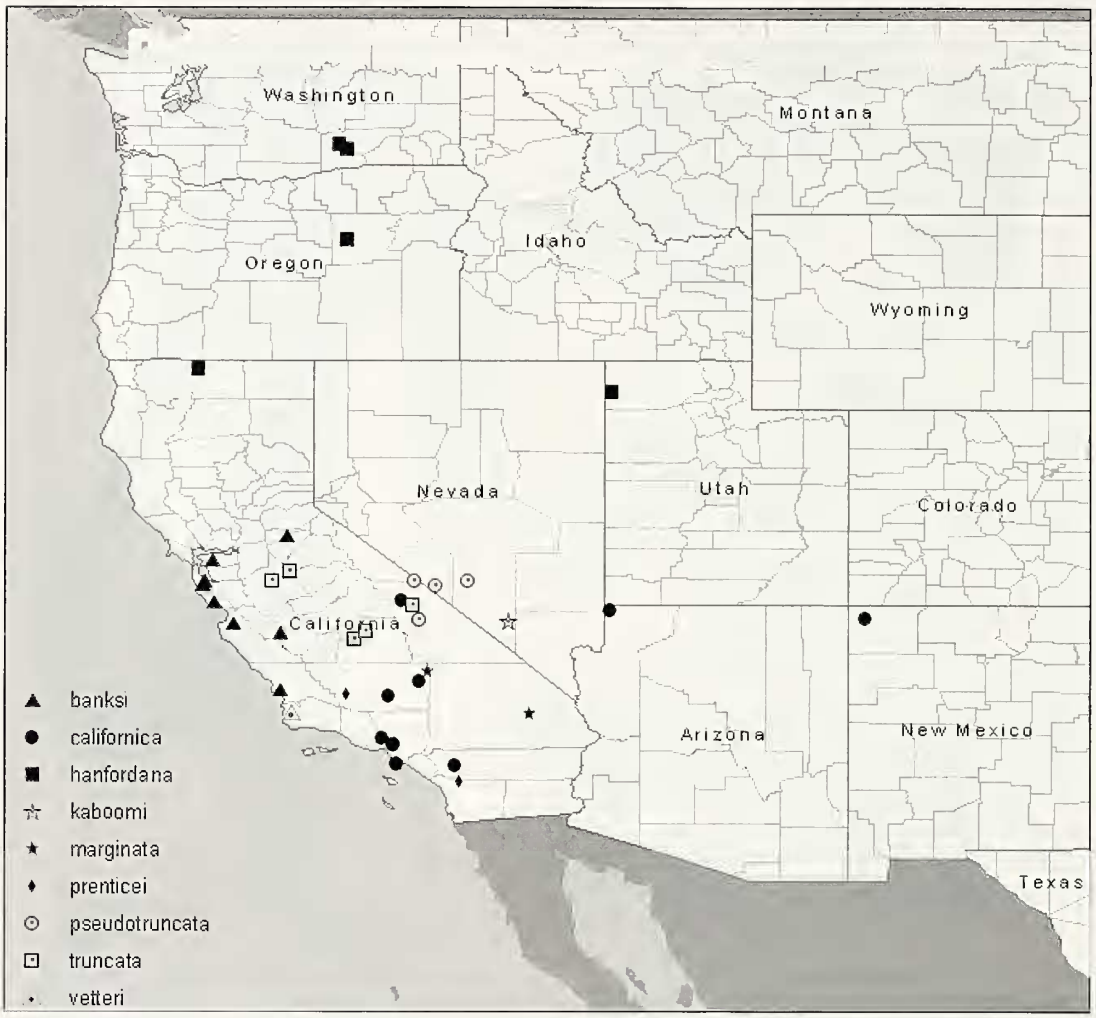


Figure 54.—Distribution map of *Hemerotrecha banksi* species group in the Western USA.

data except May 2004 (DMNS); 10 ♂, 4 ♀, Elk Hills (35.16°N, 119.31°W), T. Prentice (DMNS, UCR); 2 ♂, 3 ♀, El Paso Mountains (35.26°N, 117.49°W) August 1965, D. Gibo (UCN); 1 ♂, El Paso Mountains (35.26°N, 117.49°W) 24 June 1970, Wendel Icenogle (UCN).

Etymology.—Named for the collector, Tom Prentice, University of California, Riverside.

Diagnosis.—This species differs from the closely related *H. pseudotruncata* in its darker overall coloration and the broader, shorter ctenidia.

Description.—*Male:* Color: base coloration a creamy, dark orange, propeltidium with lateral dusky areas, eye tubercle dark, abdomen darker dorsally and ventrally with a median white stripe dorsally extending from propeltidium to sixth abdominal segment (Figs. 48, 49), palpal metatarsus dark over the entire length (Fig. 50), all legs dusky to dark on tarsus, metatarsus, tibia, and femur, coxa lighter. Leg I lighter ventrally. Malleoli edges dark.

Chelicera: fixed finger with rounded tip and typical cup like mesal ventral groove apically. No recurved area apically. Movable finger with primary tooth, two intermediate teeth, and an anterior tooth, Posterior intermediate tooth separate from the primary tooth. Fondal teeth graded I, III, II, IV ectally and I, III, II mesally. No apparent fondal notch (Fig. 51). Flagella typical of the group.

Abdomen: 2 short, broad, pointed ctenidia (Fig. 52). These are the shortest of any in this species group.

Palp: entire palp covered with setae but no spine-like setae present (Fig. 50).

Dimensions: *Male holotype*: total length 10.5, cheliceral length 2.2, cheliceral width 0.82, propeltidium length 1.35, propeltidium width 1.84, palpus length 6, first leg length 4.5, fourth leg length 8. Ratios: A/CP 5.25, cheliceral width/fixed finger width 3.0.

Male paratypes (n=5): total length 9.0–11.0, cheliceral length 2.0–2.4, cheliceral width 0.8–1.0, propeltidium length 1.2–1.4, propeltidium width 1.6–1.9, palpus length 9.0–11.0, first leg length 4.5–5.5, fourth leg length 7.0–9.5. Ratios: A/CP 5.0–5.9, cheliceral width/fixed finger width 3.0–4.3.

Female allotype: color, same as the male.

Chelicera: fixed finger typical of the group but on the movable finger the posterior intermediate tooth is closely oppressed to the posterior tooth which differs from other females of this group (Fig. 53).

Palp: same as the male with 1–2 spine-like setae ventrally.

Genital operculum: typical for the group.

Dimensions: *Female allotype*: total length 10.5, cheliceral length 2.25, cheliceral width 1.05, propeltidium length 1.2, propeltidium width 1.75, palpal length 7.0, first leg length 5.0, fourth leg length 7.5. *Ratios:* A/CP 5.27, genital length/genital width 2.0.

Female paratypes (n=5)*:* total length 10.5–11.5, cheliceral length 2.3–3.1, cheliceral width 0.9–1.0, propeltidium length 1.2–1.3, propeltidium width 1.7–2.2, palpus length 5.0–7.0, first leg length 4.0–5.0, fourth leg length 6.5–7.0. Ratios: A/CP 4.3–5.7, genital operculum length/ genital operculum width 2.3–3.1.

DISCUSSION

Adult members of the *Hemerotrecha banksi* group have been collected as early as the first week in May and as late as the middle of October. A total of 82 males and 27 females were examined in this study, indicating a greater vagility among the males. Several vials contained information suggesting that the collected specimens were active during the daytime. We suggest that all of the species of this group are diurnal. For such diurnal species, color ornamentation, particularly of the palps, could be important during courtship and mating. Although mating patterns of solifuges remain largely unknown (Punzo 1998), the few descriptions available (Muma 1966; Wharton 1981; Punzo 1998) involve the presentation of palps by both sexes.

Most North American Solifugae have white to pale malleoli. The presence of the dark edged malleoli in the *H. banski* group was not noted by Muma (1951, 1970) although he did identify them in other species (Muma 1951, 1962); i.e., *Eremochelis rothi* (Muma 1962), *Eremochelis larreae* (Muma 1962), *Hemerotrecha bidepressus* (Muma 1951), and (*Eremochelis arcellus* Muma 1962). Examination of the types of these species showed at most a very tiny edge of black. He also did not describe the cup-like cavity on the tip of the male fixed finger as a mesal ventral groove, which is surprising since he did so in the *Eremochelis branchi* group (Muma 1970). *Eremochelis striodorsalis* (Muma 1962) has an obvious ridge which Muma (1962) called a mesal dorsal groove. Examination of the type of *E. striodorsalis* reveals a faint mesal ventral groove. The dorsal ventral ridge of *E. striodorsalis* and *H. vetteri* are very similar.

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